

Supporting information

Comparison of Acid and Base Modified Biochar Derived from Douglas fir for Removal of Copper (II) from Wastewater

Beatrice Arwenyo^{1,2}, Prashan M. Rodrigo¹, Olalekan A. Olabode^{1,3}, Hashani P. Abeysinghe¹, Jessie N. Tisdale¹, Rose C. Azuba⁴, and Todd E. Mlsna^{1,*}

¹Department of Chemistry, Mississippi State University, Mississippi State, MS 39762, USA.

²Department of Chemistry, Gulu University, P O Box 166, Gulu Uganda.

³Department of Pure and Applied Chemistry, Osun State University, Osogbo, Osun State, 230212, Nigeria.

⁴College of Veterinary Medicine, Animal Resources and Biosecurity, Makerere University, Box 7062 Kampala, Uganda.

*Corresponding Author (Tel: 662- 325-6744; fax: 662-325-1618.

Email: tmlsna@chemistry.msstate.edu

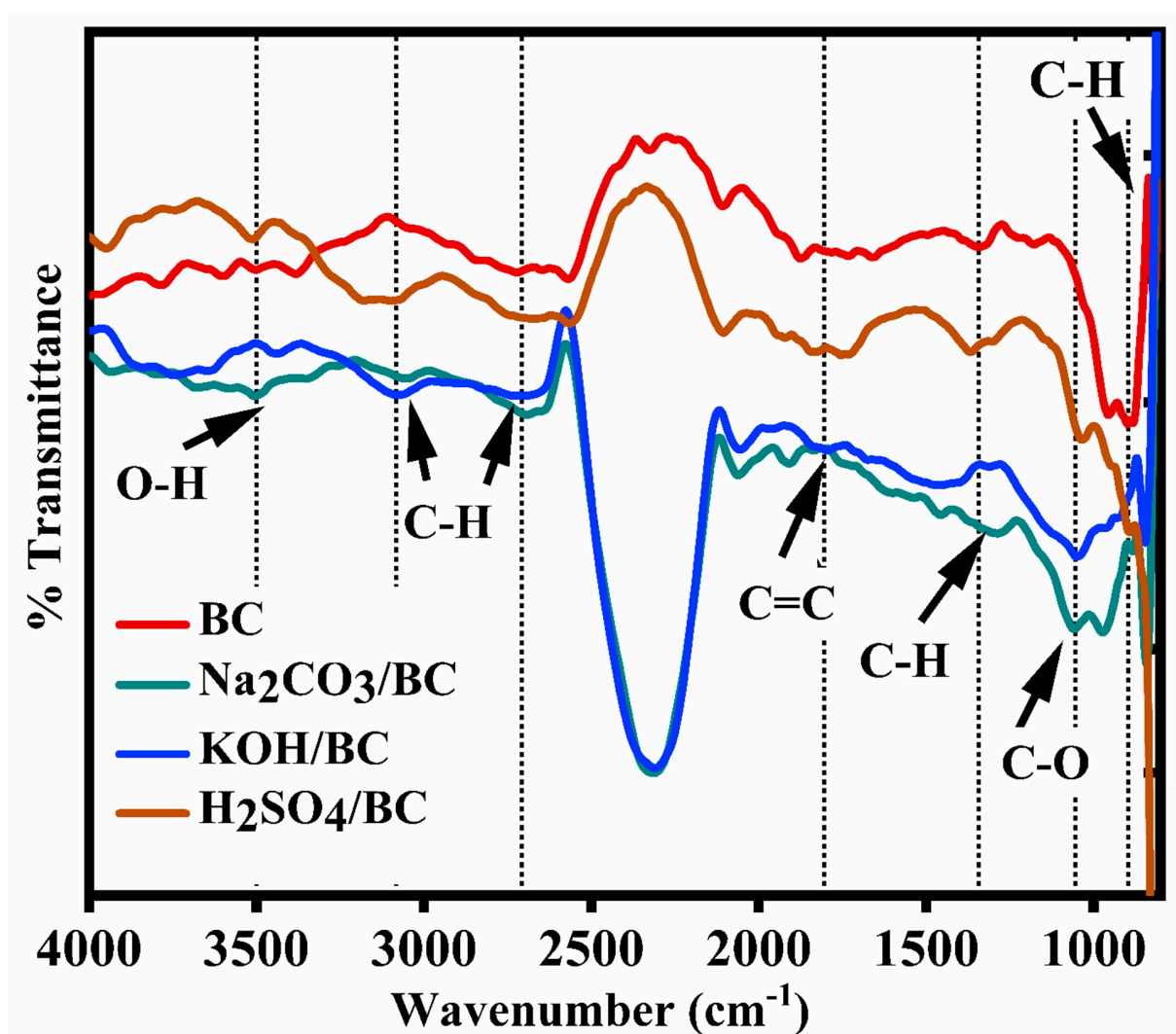


Figure S1. FTIR spectra of BC, KOH/BC, $\text{H}_2\text{SO}_4/\text{BC}$, and $\text{Na}_2\text{CO}_3/\text{BC}$.

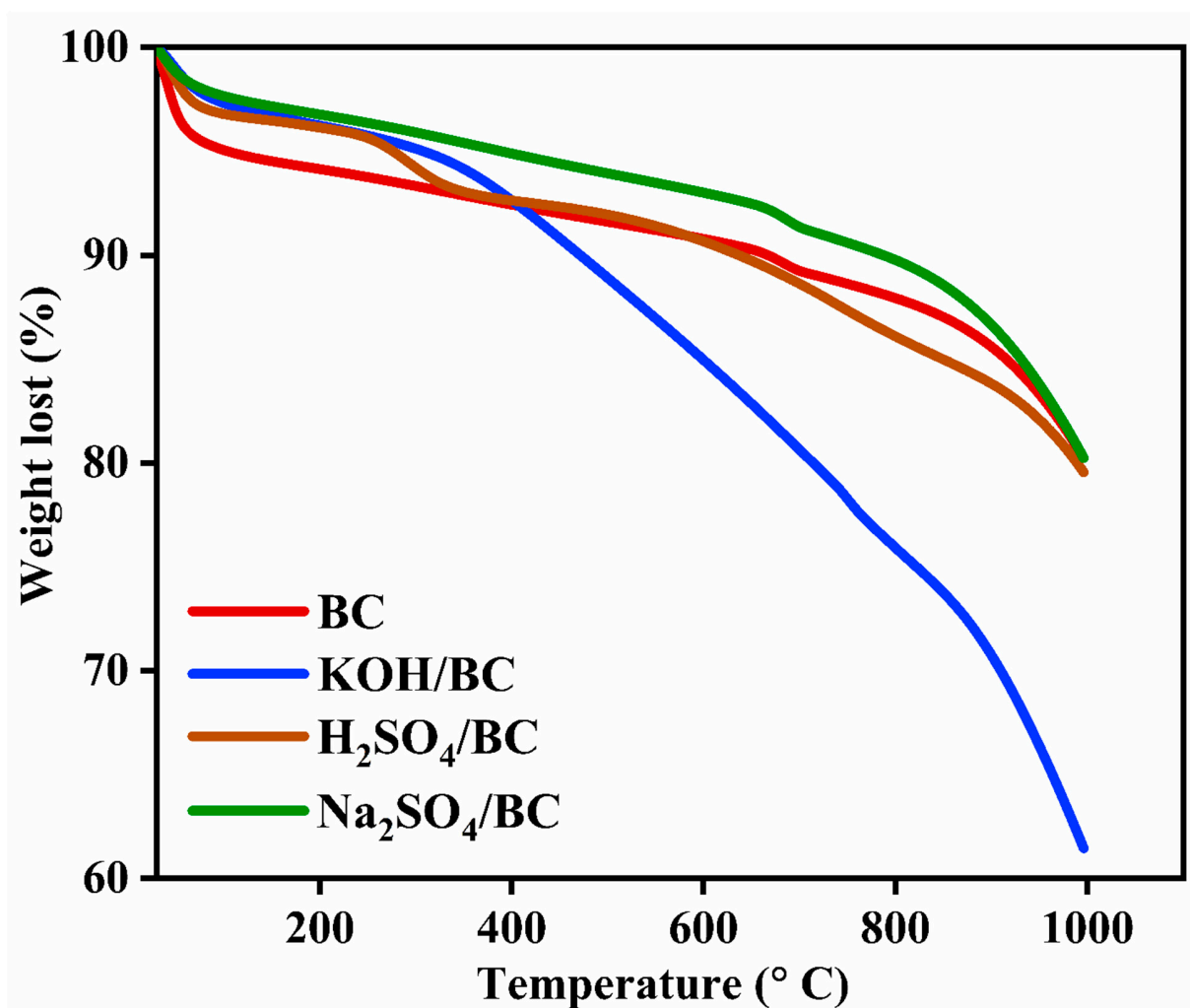


Figure S2. Thermogravimetric curve for BC, KOH/BC, Na₂CO₃/BC, and H₂SO₄/BC in nitrogen for temperature range from 25-1000 ° C.

Table S1. Initial physiochemical properties of Bluff, Briar, and Loakfoma lake water samples

	Bluff Lake	Briar Lake	Loakfoma Lake
	33.283072, -88.776972	33.432870, -88.767551	33.263047, -88.778497
pH	7.99	9.27	9.23
EC	92.9 $\mu\text{S}/\text{cm}$	131.4 $\mu\text{S}/\text{cm}$	79.3 $\mu\text{S}/\text{cm}$
Concentrations (ppb)			
Li	4	1	5
Na	7983	5123	6877
Mg	3009	1366	2177
P	Not detected (<1 ppb)	Not detected (<1 ppb)	Not detected (<1 ppb)
Ca	5432	23154	3944
Cr	12	16	17
Mn	12	4	32
Fe	758	346	879
Co	Not detected (<1 ppb)	Not detected (<1 ppb)	1
Ni	2	1	2
Cu	Not detected (<1 ppb)	Not detected (<1 ppb)	Not detected (<1 ppb)
Zn	Not detected (<1 ppb)	Not detected (<1 ppb)	Not detected (<1 ppb)
As	Not detected (<1 ppb)	Not detected (<1 ppb)	1
Se	Not detected (<1 ppb)	Not detected (<1 ppb)	Not detected (<1 ppb)
Mo	Not detected (<1 ppb)	Not detected (<1 ppb)	Not detected (<1 ppb)
Ba	23	6	20
Pb	25	30	36
U	Not detected (<1 ppb)	Not detected (<1 ppb)	Not detected (<1 ppb)